DOCUMENT RESUME

ED 040 270 VT 009 768

TITLE	Guidelines for Manpower Utilization Studies. VA Pamphlet 07-11.
INSTITUTION	Veterans Administration, Washington, D.C.
PUB DATE	Mar 69
NOTE	74p.
EDRS PRICE	EDRS Price MF-$0.50 HC-$3.80
DESCRIPTORS	*Evaluation Criteria, *Evaluation Methods, *Guidelines, *Manpower Utilization, *Program Evaluation
IDENTIFIERS	*Veterans Administration

ABSTRACT

These guidelines for conducting a manpower utilization study are designed for independent use or in conjunction with any existing work measurement program for determining manpower requirements. Although the instructions are complete enough for use by themselves, a bibliography of publications is included to provide additional background information and a more refined application of the suggested techniques. The language is deliberately elemental so that all interested personnel may apply the criteria outlines. There are 28 phases outlined under seven categories: preliminary actions, organization study, manpower analysis, manpower utilization, workload analysis, procedure evaluation, and special studies. Specific techniques for certain phases are detailed in five attachments. (CD)

ED040270

VA PAMPHLET 07-11
MARCH 1969

GUIDELINES FOR

MANPOWER UTILIZATION STUDIES

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PREFACE

One of the primary responsibilities of management is the achievement of an effective balance between resources applied to an activity and the accomplishments of that activity. Manpower is one of the more expensive resource inputs and greater economies can be attained when its use is subjected to a periodic analysis.

This pamphlet describes an approach for conducting a manpower utilization study. It is designed for independent use or in conjuction with any existing work measurement program for determining manpower requirements. The two systems should complement each other as the techniques described herein will result in better manpower utilization within the framework of any existing or authorized staffing alignment.

These guidelines do not change or establish VA policy. The use of the proposed techniques is optional unless otherwise required.

The following instructions are complete enough for conducting a manpower study. However, a review of the publications listed in the attached bibliography will furnish additional background information and, in some cases, enable a more refined application of the suggested techniques.

Experienced analysts will find the language of these guidelines quite elemental and perhaps repetitious of their own experiences. This is intentional so all interested personnel will be able to apply the criteria even though previous experience has not been attained in the conduct of manpower studies. The director or manager of a field installation can accordingly use these guidelines as a base for directing an operating official to conduct a manpower study of his own operation. The experienced analyst may find some of the material useful as a "refresher" or as a training guide for those not familiar with manpower techniques.

It is not intended that all of the 28 phases outlined by this pamphlet will be applied in every manpower review. If a particular study concentrates on organization, the phases in Chapter 2 may be the only ones used. Other studies may require a combination of phases (but not necessarily all) selected on the basis of findings during the casual observations prescribed by Phase 4.

The degree of emphasis to be placed on any one of the phases will vary due to the nature of the work, space requirements, equipment and other considerations but all programs are susceptible to a manpower review of this type.

The existence of understaffing could mean inferior quality in the service given to veterans and their beneficiaries. The pressures resulting from this understaffing can often be lessened by improving procedures, eliminating non-essential work or other administrative actions taken on the basis of a review of operations. An overstaffing situation results in excess costs for accomplishment of the program mission. The extent of the overstaffing should be isolated and eliminated. The accomplishment of either one of these objectives takes ambition, aggressiveness and knowledge. This pamphlet is written for anyone willing to tackle the problem.

* * *

The term "analyst" used in these guidelines has no special connotation and refers to anyone conducting a manpower review.

Chapter 1. PRELIMINARY ACTIONS. . .

There are many things to be done before plunging into the details of a manpower review. The study objectives, techniques required, mission and environmental conditions of the program should be completely understood. The time taken to lay this groundwork results in a smoother study and pays dividends in the form of better comprehension and interpretation of the findings.

This chapter suggests certain preliminary actions for the study. The succeeding chapters set forth techniques and guidance for the in-depth analysis of the operation. Do not be over-anxious to get into the details. Spend a little extra time on the indoctrination phases discussed in this chapter and develop a study plan.

PHASE 1. ESTABLISH PERSONAL RELATIONSHIPS

If the manpower review is conducted by an operating official directly responsible for an activity, the personal relationships should be already established. It is not a bad idea to have someone outside the Service/Division (hereafter referred to as Service) participate in the study. It is difficult for an operating official to look at his own activities with complete objectivity and discussions with someone not intimately acquainted with the operation can be helpful.

If the manpower review is conducted by a staff official, such as a Management Analyst or Special Assistant, particular attention should be given to personal relationships. The review will be of little value

if the Chief of the Service does not accept the findings and recommendations of the analyst. This non-acceptance usually will not happen if the Service Chief has been properly oriented and knows that the interests and objectives of the analyst are not in conflict with his own thinking.

The initial efforts of the analyst should be spent developing a working relationship with the Chief of the Service. The purpose of the study and planned approach should be thoroughly explained. Emphasize that this is to be a cooperative effort because employees assigned to the Service have the technical knowledge required for a successful manpower study. The Service Chief should be told that he (or she) will have an opportunity to review and discuss the recommendations before they are shown to the next higher level of management.

All kinds of questions about the Service should be asked. What is its mission? What difficulties are being encountered in carrying out this mission? Are there recruitment problems? Do seasonal workloads, if any, create peaks and valleys which are troublesome? What is the employee turnover rate? Have there been any recent changes of key personnel? Are there any morale problems? What long or short term plans have a bearing on the study? Are equipment needs adequate? Any space problems? . . . . . Think of more questions and, finally, ask the Service Chief if he has any inquiries about the study or suggestions on areas which should receive special attention.

The Service Chief should be asked to designate a liaison representative from each of the major functions within the Service. These designees will act as technical advisors to the analyst. This should not interfere with the accomplishment of their normal duties.

The analyst should be careful not to pull any surprises. If any matter of significance develops which has not been discussed with the Service Chief, make it a point to keep him informed. Otherwise, day-to-day problems should be settled at lower levels of management within the Service.

PHASE 2. STUDY EXISTING DOCUMENTATION

The Service should have and use: (1) an organization chart (2) position descriptions (3) written procedures (4) mission statement and (5) scheduled tours of duty when applicable. If these do not exist, duplication, confusion about responsibilities, informal relationships, lack of continuity, poor planning and inferior quality are apt to be the result. The analyst should obtain these documents, if available, study them, and

visualize some things to check out when the details of the study are developed beginning with Chapter 2.

ORGANIZATION CHART

A good looking organization chart is no guarantee of a good organization but it does give some assurance that management is conscious of its value. A smoother organization will generally result when employees are organized and know how they are organized. The chart should be used for: (1) informing employees and outsiders of the organization structure (2) discovery and cure of organization defects and (3) control of positions authorized and filled.

POSITION DESCRIPTIONS

Position descriptions support the organization chart by outlining the specific duties of each employee. These descriptions should be kept current and each employee should have a copy for familiarization with its requirements.

WRITTEN PROCEDURES

The existence of written procedures indicates that systematic analyses are being made of the work processes. It is easier to tell an employee how to do a job than it is to write the procedure but there is also a lack of consistency when each employee is free lancing as to how to do the work. Written procedures are especially useful when complex equipment is being used or when the work is done in several stages. Some of the uses are:

- Serves as a reference point for employees whenever doubts arise as to the approved method.
- Saves time in the training of new employees.
- Minimizes effect of absenteeism as a substitute worker can do the job without extensive training.
- Acts as a good communications media for orientation of all employees on the mechanics of each job.
- Increases quality levels if periodic reviews are made to insure that each employee is following the approved procedure.

If written procedures do exist, the analyst should review them for duplication and inefficiencies when the procedures are analyzed, Chapter 6. The written procedures should also be current and not a representation of how things were done in the past.

MISSION STATEMENT

The mission statement, long and short term objectives (goals) furnishes information on the program responsibilities and plans for carrying out these responsibilities. The analyst needs this information so any subsequent observations, findings and recommendations will fit within the framework of the program objectives.

SCHEDULED TOURS OF DUTY

The tours of duty - regular and irregular - should be arranged to the best advantage for meeting the needs of the station. This results in improved service, reduced overtime, greater economies and improved morale. The analyst may find a better arrangement of the existing tours when the detailed information is developed under the criteria of subsequent chapters.

PHASE 3. REVIEW LEAVE USAGE AND TURNOVER

The analyst should get an insight on leave usage and the turnover rate before studying the technical aspects of a program. Both of these factors are good barometers of the morale of an employee group.

SICK LEAVE

The attainment of effective manpower utilization is handicapped when management is exposed to an excessive amount of unplanned absenteeism. Correction of a sick leave problem will usually be a long term process because there is no real positive action available other than consultation with the employees who are abusing their privileges. This approach may not result in an effective or continuing solution. It is generally necessary to find and correct the root of the problem - an example being boredom.

The analyst should find out what the supervisory staff has done to determine whether sick leave is being abused. Their analysis may be complete enough to save the time of reviewing individual records.

ANNUAL LEAVE

Vacation schedules should be maintained so management can plan absenteeism for periods when its impact is lessened.

TURNOVER

The supervisor's fear of turnover is one reason given for a breakdown of dicipline. This fear is unfounded since most employees would rather work in a well-organized, disciplined establishment than one where obvious violation of rules is tolerated.

The cause of turnover, like sick leave, is difficult to pinpoint but it is expensive. Turnover which appears excessive should be investigated. A good source is to check with Personnel on complaints, employee and union grievances or other leads. Information received during exit interviews should also be considered, recognizing that some employees may avoid giving any controversial reasons for leaving.

Turnover may be attributible to the labor market but this should not be assumed until after an analysis of internal associations.

PHASE 4. OBSERVE THE OPERATION

At least one day (more time than this should be spent in large operations) of the preliminary work should be used for looking around the operation to detect symptoms which will indicate the current level of performance. The observations should be made in a casual manner with no thought of making a detailed analysis at this time.

The skill of making good observations must be cultivated but even the analyst who has not previously used this technique will quickly find himself getting the "feel" of the operation. Improvement possibilities will be noted for future study and some weaknesses will be found which can be quickly corrected. Informal notes can be made on those observations requiring development of more facts during the detailed analysis.

The operation is probably inefficient if the following symptoms are observed:

- Excessive idle time.
- Tardiness and early departures.

- Excessive cleanup time - employees spending the last 15-30 minutes of the day on unnecessary activities or waiting for quitting time.
- Excessive absenteeism from the work area - this absenteeism may be justifiable but it is also a symptom of work shortage or indifference.
- Uneven work pace - Employees working at a feverish pace part of the day and at a relaxed pace or doing nothing at other times. There may be short term peaks and valleys in the work flow which can be corrected.
- Too much movement - Indecision or lack of training may exist if employees go to the supervisor often or talk among themselves about business matters.
- Overstuffed files or lack of file guides - This can cause excessive use of time for filing and locating documents.
- Poor space layout - resulting in too much walking or congestion.
- Uneven distribution of work - some employees overburdened with work while others lack enough work to keep busy.
- Excessive logging of incoming and outgoing work.
- Poor condition of equipment - frequent breakdowns, excessive noise or antiquated models.
- Unexplained activities which do not appear to be related to the mission of the operation.
- Poor work flow - Employees carrying documents to other employees or to centralized locations for completion of the processing cycle.
- Cluttered desks, material on top of files or on the floor.
- Supervisors acting as senior clerks rather than supervisors.

The absence of the above symptoms would suggest that the operation is reasonably efficient but a detailed analysis will be necessary to substantiate this assumption.

* * *

At this point, the analyst should have pretty good knowledge about the operation and some ideas on the future course of the study. The phases described by the succeeding chapters will provide guidance for an analysis of the areas to be studied.

Chapter 2.
ORGANIZATION STUDY . . .

PHASE 5. PREVIEW ORGANIZATIONAL ALIGNMENT

A general evaluation should be made of the organizational alignment. Functional groupings should be logical and job titles with related position descriptions should conform to what the employees are actually doing.

PHASE 6. DETERMINE EMPLOYMENT TREND

The position types for each of the last five years should be laid out to determine if any shift has been made in the organization alignment. A reduction in those positions affected by automation would be expected. An increase in the number of certain positions would be expected to offset any increased workload or assignment of additional duties. Significant shifts in position types, or the addition of supervisors, should be explainable. If no valid explanation can be found, an unjustifiable escalation of the grade structure may have occurred with its accompanying increase in payroll costs. The ratio of supervisors per FTEE should also be checked to see if any deterioration has taken place.

The analyst should use judgment in categorizing positions for this review. Employees of the same grade doing similar type work can be grouped even though the position titles may be different.

PHASE 7. ANALYZE PERSONNEL STRUCTURE

The personnel structure of the Service should be analyzed for layering or fragmentation. Too many supervisors will:

- Increase costs
- Delay decision making
- Slow work processes
- Result in too close supervision
- Impede supervisory development
- Decrease supervisory initiative
- Result in fragmentation and inefficient grouping of employees.

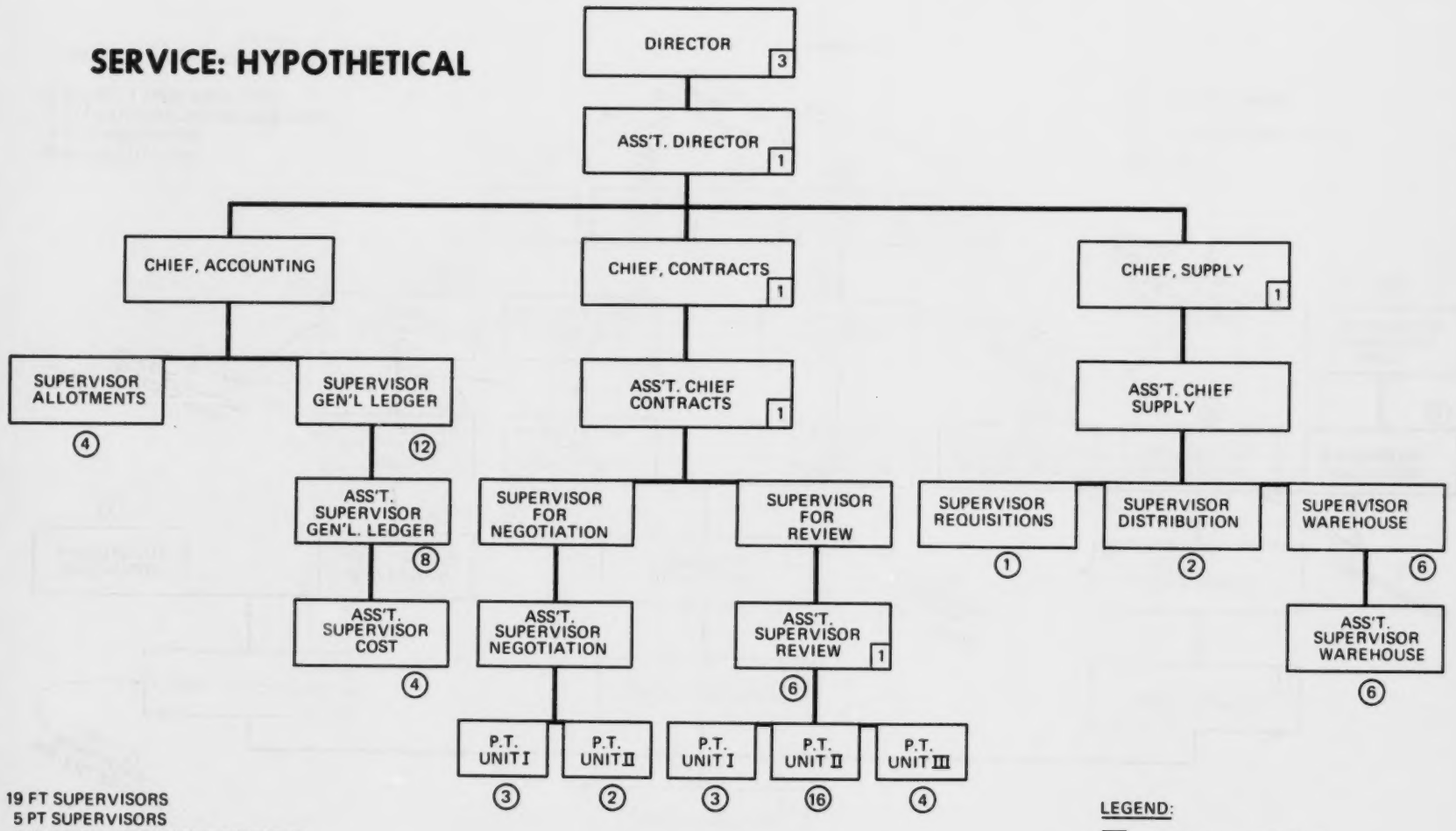
Excess supervision may result from (1) poor control over titles (2) attempts to give deserving technicians a raise (3) unbalanced attrition during periods of diminishing workloads or (4) poor reassignments during organizational changes. Whatever the cause, this facet of the operation should be studied for possible correction of organizational defects.

Figure 1 illustrates a hypothetical organization layout showing the following information for making an analysis of layering or fragmentation:

- Position titles of all supervisors
- Supervisory alignment
- Number of clerical positions assigned to each supervisor
- Number of direct labor employees (See definition Attachment I) supervised by each supervisor.
- Overall ratio of direct labor employees to supervisors.

Comments, such as those shown on Figure 2, can be made directly on the chart to show apparent weaknesses in the organizational structure.

SERVICE: HYPOTHETICAL



19 FT SUPERVISORS
5 PT SUPERVISORS
8 CLERICAL OVERHEAD POSITIONS
77 DIRECT LABOR POSITIONS

RATIO: DIRECT LABOR TO SUPERVISORS
3.2 TO 1

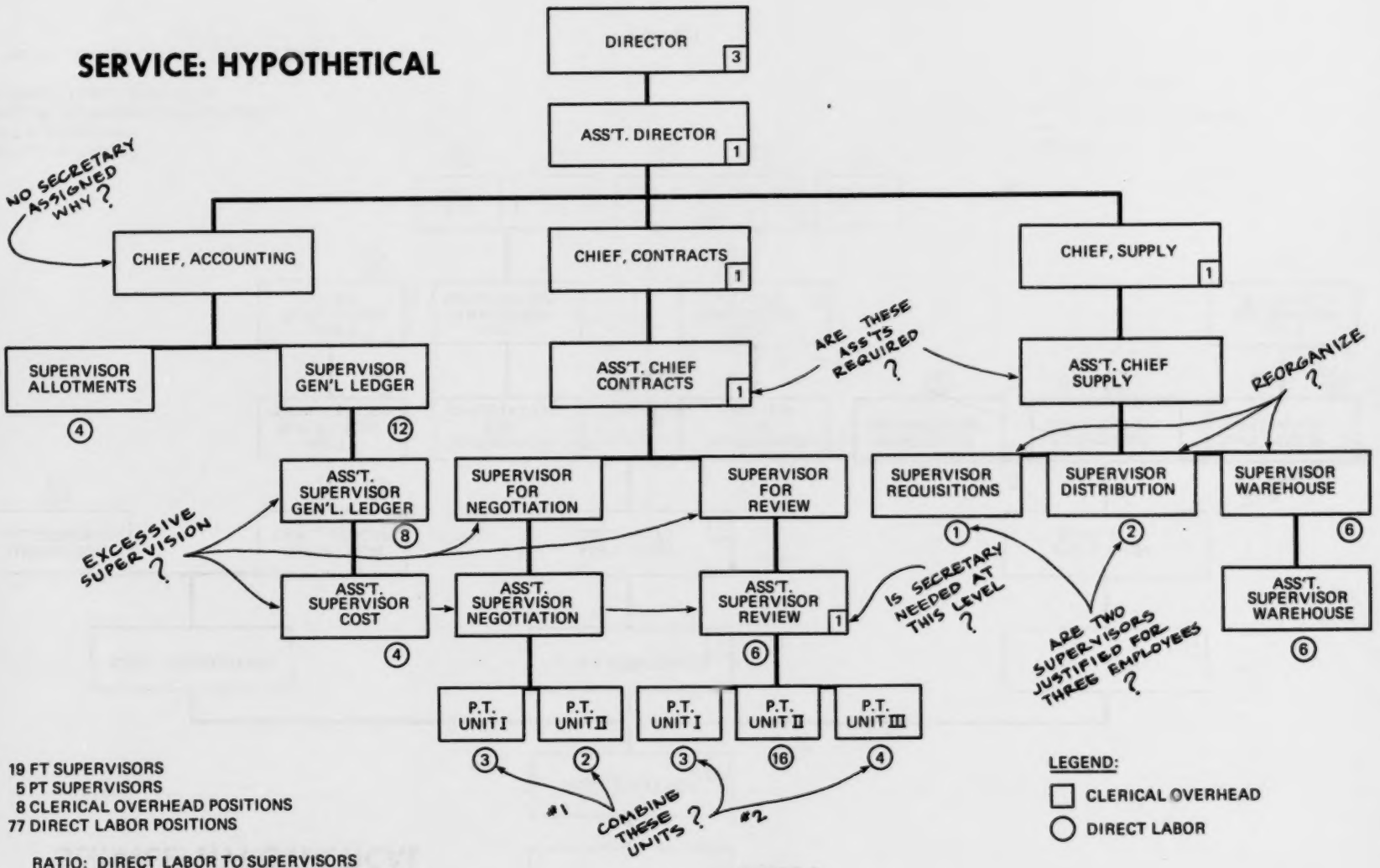
LEGEND:

□ CLERICAL OVERHEAD

○ DIRECT LABOR

FIGURE 1

SERVICE: HYPOTHETICAL



19 FT SUPERVISORS
5 PT SUPERVISORS
8 CLERICAL OVERHEAD POSITIONS
77 DIRECT LABOR POSITIONS

RATIO: DIRECT LABOR TO SUPERVISORS
3.2 TO 1

LEGEND:
- □ CLERICAL OVERHEAD
- ○ DIRECT LABOR

FIGURE 2

The preceding organization chart can be developed from an onsite study (particularly if the Service is in one place) but some difficulty may be experienced in grouping employees into appropriate categories. An alternative method of reconstructing the chart is provided by Attachment I which is especially effective when the Service is not all in one place. This method also provides firsthand information from all supervisors in the Service who should have knowledge of the employees under their immediate supervision.

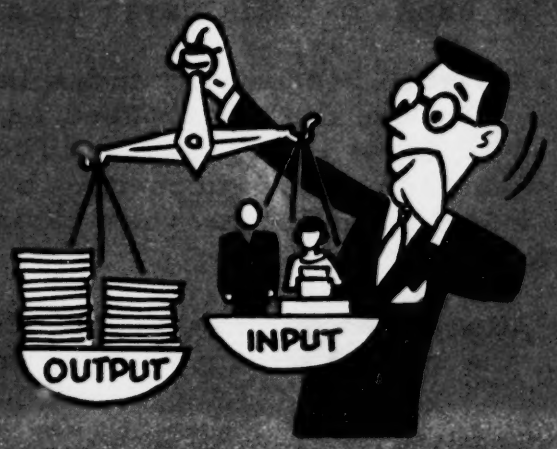
PHASE 8. CHECK OUT INFORMAL ORGANIZATION

Usually there is nothing wrong with an informal organization - it is a natural development in the relationship of people. Many times these informal relationships are beneficial and result in increased efficiency. Any attempt to suppress the informal organization would be awkward and resented by those participating in the informal relationships. However, management should be aware of the operations functioning on this basis because trouble spots may develop if the deviation from the formal organization is significant.

The informal organization can generally be traced back to (1) delays in processing through regular channels (2) unwarranted assumption of authority (3) mistaken understanding of duties (4) failure of a supervisor to assume responsibilities inherent to the position and (5) unrecognized talent.

The function and position organization charts, position descriptions and written procedures are good sources for isolating deviations from the formal organization. The observations of the analyst may also reveal how the informal organization operates. One observation technique is the plotting of personal relationships which is illustrated by Attachment II. The finished chart based on these observations will show who the employees are looking to for guidance and whether the supervisors are being left out of some decision-making with its accompanying loss of needed information.

Chapter 3. MANPOWER ANALYSIS. . .



PHASE 9. COMPUTE PRODUCTIVITY CHANGES

Productivity is the ratio of output to input - that is, the amount of services or goods produced in relation to the resources utilized. Resources include manpower, capital goods, and purchased intermediate products or services. A productivity index can be computed by finding the relationship between the amount of services or goods produced (output) and the amount of all resources (input) used. A partial productivity index results when one or several resources, but not all, are compared with the services or goods produced. This pamphlet is concerned with manpower so only a partial productivity index is needed for this phase of the study.

A measurement of productivity can be made for most of the VA programs. Work measurement standards, if available, can be used as a base for development of the time requirements for production of a unit of output. The analyst will have to develop time requirements (weights) for each unit of output if the Service is not under a work measurement system. This will not be too difficult since weights for productivity measurement can be developed by technical estimates without resorting to an engineered approach generally required for work measurement standards. This lack of precision is acceptable because the provision for a continual comparison against a base year will tend to level out any bias resulting from weights which do not reflect the

exact resource requirements (manpower in this case) for processing the selected workload factors. The Work Sampling Study (See Phase 27) can be used in some cases as a guide for developing these weights.

A partial productivity index should be computed for five successive years with the sixth year used as a base. Specifically, if the period 1964-1968 is reviewed, 1963 would be used as the base year for comparison with each of the succeeding five years. The computations may be on a fiscal or calendar year basis depending on how the data appears on source documents.

Attachment III furnishes a step by step explanation on how to develop the criteria required for computing a partial productivity index.

PHASE 10. REVIEW METHOD FOR DETERMINING MANPOWER NEEDS

The analyst should expect to find some systematic method for determining manpower requirements even though a work measurement program has not been developed for the Service. The acceptance of "off-the-cuff" estimates has virtually disappeared. A good method can exist without work-rate standards based on time and motion studies, work sampling, predetermined times or other techniques. Some programs are not susceptible to a measurement program based on work-rate standards due to (1) lack of volume production or (2) inability to develop a realistic "average processing time" because of variability in work units having similar physical characteristics. A broader type of measurement is required for these operations. Some possibilities are:

- Ratios showing, for example, the number of employees to other factors such as workload, other employees or beneficiaries.
- Technical Estimates on the processing time required per unit of work -- these estimates can be made on an individual basis if the unit processing time is significant or on a group (batch) basis if the processing time per unit makes handling on an individual basis impractical. See example format in Attachment IV.
- Project Control Reporting through estimates in the time requirements for completion of a project in those operations dealing with diversified long-term activities.
- Trend Data - Projection of historical experience to determine future manpower requirements with a goal towards improved productivity.

The method used by the Service should be reviewed for validity.

PHASE 11. REVIEW REQUESTS FOR PERSONNEL ADJUSTMENTS

An analysis should be made of any requests for increases or decreases in personnel during the past 12 months. This will furnish an insight into the Service Chief's evaluation of staffing requirements. The overtime, borrowed and loaned time should also be reviewed to see if these have any relationship to requests for personnel adjustments.

Chapter 4.
MANPOWER UTILIZATION

PHASE 12. REVIEW TRAINING PROGRAM

Negligence in training new employees is costly and failure to keep them trained is equally extravagant. Are courses taken put to profitable use? Are internal training sessions pertinent and returning dividends to the program? Are publications on specialized fields available and read by the employees? Is administrative material screened for applicability before it is circulated for reading by all employees? Is cross training on the job being emphasized to provide flexibility in work assignments?

PHASE 13. CHECK FOR DUPLICATION OF EFFORT

The analyst should be alert in noting probable savings through elimination of duplicated effort, both within and outside the Service. Some general areas where duplication of effort may exist are:

FILE MAINTENANCE

This is often seen in the maintenance of correspondence but duplication may exist in any type of files. If a centralized filing system

is used, the Services may be keeping duplicate systems for their reference. The result is increased reproduction costs and unnecessary expenditure of manhours for file maintenance.

REPORTS

It would be unusual to find exact duplicates of reports from separate sources but any duplication within the reports should be eliminated. (See Phase 23.)

"BUDDY SYSTEM"

Two or more employees may routinely work on jobs which could be accomplished by one individual. This could occur because of (1) poor screening when work assignments are made(2) employees being used to working together as a team or (3) inadequate procedures. Maintenance work is the classic example. (Also see Phase 24.)

TRANSCRIPTION

One example would be the unnecessary typing of handwritten material. This not only duplicates effort but delays processing of pertinent information.

CORRESPONDENCE

Two or more notifications or requests for information submitted to veterans or their beneficiaries when one consolidated contact would suffice. Acknowledgement letters can sometimes be expanded to include subsequent routine requests for data.

PHASE 14. ASCERTAIN EXTENT OF SPECIALIZATION

Specialization has its place, particularly in professional fields where the advancement of science and technology requires considerable study just to keep abreast with one specialty in a given field. However, the view that specialization has been overemphasized in many clerical and technical jobs is gaining acceptance. Some of the problems created by specialization are:

- Bottlenecks - Employees may be persistent in solving a problem irrespective of time thereby impeding the work flow. A

bottleneck may also result where some employees have more to do on a case than other employees.

- Boredom - Inducing monotony and fatigue.
- Work delays - Due to absenteeism of a particular specialist - a buildup of a backlog may also result.
- Inhibited employee development - By restricting the use of his inherent ability and intellectual capacity.
- Imbalance of Work Distribution - This problem occurs where employees are responsible for a particular segment of the operation - a portion of the alphabet, a specific set of accounts, a certain type of case or document, a particular kind of machine or piece of equipment. Time is lost under these arrangements when the incoming daily workload in any one segment is less than the employees' ability to produce. Employees in other segments of the operation may have more work than they can accomplish in a timely manner.

Job enlargement provides flexibility in work assignments and helps to correct the problems mentioned above. Most employees, properly trained, are capable of performing varied tasks and are stimulated by an understanding of the whole job rather than a narrow segment.

PHASE 15. REVIEW OVERTIME

It should not be assumed that an operation is understaffed because it works a lot of overtime. It may seem impossible to do all the work without overtime but a good analysis sometimes shows that overtime can be eliminated, or at least reduced.

Some of the alternatives to overtime are:

- Postpone the work to a later date.
- Detail employees from other Services to do the work.
- Hire part-time employees.
- Level out production to eliminate "crash" periods.
- Simplify the work.

- Transfer the work to some other Service.
- Change deadline dates.
- Level out employment on shifts.

The analyst should check overtime very carefully to determine if the station policy can be tightened. The overtime used can be analyzed by having employees furnish the following information covering a recent period:

- Type of O/T used ☐ paid ☐ compensatory
- Period of O/T _____
- Name of employee _____
- No. O/T hours worked _____
- Reason for O/T _____
- Accomplishment during O/T _____
- What alternative to O/T was available _____
- What would have happened if O/T had not been worked _____

Excessive overtime cuts into the efficiency during regular working hours by creating mental and physical fatigue. If there is no available remedy for the overtime, activities such as training and staff meetings should be held to a minimum until normal work hours are restored.

PHASE 16. UTILIZATION OF WORK POOLS

The most common work pool is of typists assigned to do the work of several operations. These work pools are established to:

- Decrease costs
- Obtain uniformity
- Insure better control of work flow
- Improve employee utilization

There may be a tendency not to use an existing pool. This is wasteful and uneconomical. Routine work should be sent to typing pools in lieu of keeping additional clerical personnel on duty in each Service.

The analyst should review the paperwork to determine if more use of typing pools is feasible. Work being done in the Service which can be handled by typing pools should be itemized. The supervisory staff of the Service can then be asked to comment on why this work has not been given to the pool for processing.

PHASE 17. ANALYZE METHOD OF WORK ASSIGNMENTS

Work Scheduling, also called Short Interval Scheduling, is a system of measuring and controlling the work of each employee. It is defined as a method of systematically assigning work to employees in small measured batches with a scheduled processing time for completion of each batch. The primary procedural steps for operating the system are:

- Sort, batch and assign priority to incoming work.
- Compute scheduled processing time for each batch.
- Give batches to employees on a systematic basis.
- Compute actual time required by the employee for completion of the batch.
- Compute the Performance Level of each employee by comparing scheduled time with actual time.

Another form of scheduling is to assign employees, such as custodians, to specific areas or routes for completion of recurring tasks which can be accomplished during a normal workday.

Generally, employees like the above methods for assigning work because they know what is expected of them. The control of quality is also simplified since any deficiencies can be traced to an individual employee. Physical handicaps and need for training or counselling become evident as the work of each employee is reviewed for timeliness and

accuracy. Employees are also motivated through known achievements - - the built-in competition which exists both among employees and for each employee's own goal. The system will also:

- Increase overall productivity
- Enable better control of work flow
- Improve employee-supervisory relationships
- Result in equal distribution of work
- Organize the work force
- Permit accurate forecasting of workload and manpower needs.

The foregoing illustrates the general mechanics of a formal Work Scheduling System. The absence of a formal system should not discourage the use of some form of scheduling work. The definition of Work Scheduling can be generalized to mean planning for the completion of work assignments according to their importance and availability of manhours. The supervisor does not have to know exactly how long each job may take since the mere assignment of jobs on a planned basis will improve productivity. The assignment of jobs by priority will insure that the most important work is done first.

One of the major causes of inefficiency is poor planning - people waiting for work or instructions and wondering what to do next. Another cause of inefficiency is the placing of all work in a centralized place from which employees obtain work on an "as needed" basis. Here the employees have an option of doing what their inclinations dictate. Some employees will work at a feverish pace while others will be dilatory.

It is easy for the supervisor to load up the willing worker, do the job himself or forget about priorities and secondary projects but this type of supervision leads to confusion and unnecessary expense.

The efficiency will be high when the supervisor makes definite work assignments and has a method of judging whether the assignments are performed in a timely and accurate manner. Backlogs will disappear, secondary work delayed due to lack of time will be completed, overtime will be reduced or eliminated, quality will improve and supervisors will soon be looking for more work to keep the employees busy.

Some analysts may wish to develop estimated time values to aid supervisors in the scheduling of work. This is acceptable except that Performance Levels should not be computed in the absence of precise

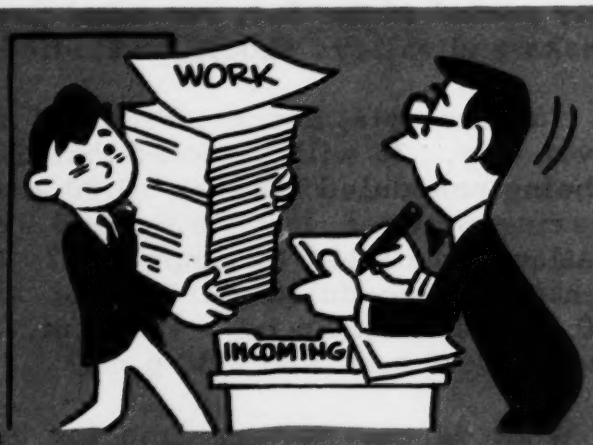
time requirements for accomplishment of an assigned task. Benefits will result from scheduling without this feature of the system.

PHASE 18. CHECK ON SUPERVISORY ACTIVITIES

A supervisor may be overburdening himself with details that should be delegated. Many employees are selected for supervisory positions because of technical proficiency in their previous jobs. The shift from an expert doer to a supervisor is a difficult one and many supervisors continue to be doers by handling the "tough" cases. Some supervisors apparently believe they can produce enough to offset their failure to simplify the work and stimulate the employees under their supervision.

A delicate situation will arise when a supervisor is found neglecting his responsibilities. The supervisor's superior should have corrected the situation in the process of performance evaluations but the mere existence of the problem indicates that this has not been successfully accomplished. The problem may stem from a lack of training and, as a consequence, the supervisor does not understand the requirements of effective supervision.

Chapter 5. WORKLOAD ANALYSIS. . .



PHASE 19. STUDY TIMING OF INCOMING WORKLOAD

The flow of incoming work usually cannot be regulated for the convenience of management. However, actions can be taken to reduce the impact of a fluctuating workload once the pattern of receipt has been established.

Figure 3 illustrates a format used to compile information on the incoming workload by type and time of day received. The workload by type entered in the first column could be correspondence, X-ray requests, cases, laboratory tests, requisitions, work orders or any other significant workload items which can be identified. Across the top of the form is a breakdown of the day by hour. The body of the form has entries on the number of work units received during specific hours of the day. The bottom two lines show the total units and the percentage of work received during each hour.

An inventory of this type should be made for a one week period. A recapitulation can then be developed showing an overall breakdown of the workload received each hour of the day and each day of the week.

No action is generally required if this analysis shows a consistent pattern of workload receipts over a one week period. If most of the work is being received on a particular day, segment of the week or

hourly period of the day, remedial possibilities for reducing the impact of peaks and valleys should be studied.

For example, assume Figure 3 represents the X-ray requests for a given day. It will be noted that the format shows 77% of the X-rays are being scheduled between 10:00 a.m. and 2:30 p.m. with the high point appearing between 11:00 a.m. and 12:00 Noon. Can the scheduling of outpatient treatment be improved? Can more X-rays for hospitalized patients be scheduled during the slack period between 8:00 a.m. - 10:00 a.m. and 2:30 p.m. - 4:30 p.m. thereby alleviating the rush period between 10:00 a.m. and 2:30 p.m.?

What is the waiting time for patients scheduled during the rush period between 11:00 a.m. and 12:00 Noon compared to those scheduled during a slack period between 9:00 a.m. and 10:00 a.m.? If there is no significant difference in waiting time, the Service is apparently staffed to take care of peak periods. What action has been taken to reduce idle time during the slack periods under this circumstance? If there is a significant difference, what can be done to improve service to the patients?

In those operations dealing primarily with paperwork, priorities should be established where work requiring expeditious handling is separated and processed immediately. Second priority items can then be used to build up a pending workload (See Phase 21) for processing during the slack periods. Other possibilities will become evident as each operation is analyzed in this manner.

A buildup of staffing requirements to cover peak periods is expensive because of poor manpower utilization during slack periods. The pressure of peak periods also contributes to errors. For these reasons, the analyst should try to level out workload receipts through better scheduling or, where incoming work is not controllable, by setting priorities so some work received during peak periods can be processed during slack periods.

PHASE 20. COMPARE PROJECTED WITH ACTUAL WORKLOAD

The budgeted workload should be compared with the actual workload. Consistent over-estimates of workloads will tend to cause overstaffing. It is granted that the over-estimate soon becomes evident but the analyst should be assured that timely staffing adjustments are being made to conform with the actual workload requirements. The opposite would be true if workload projections were under-estimated.

WORK COUNT

INCOMING WORKLOAD

DAY: Monday 7/29/68

TYPE OF WORK	TIME RECEIVED							
	8 - 9 A.M.	9 - 10 A.M.	10 - 11 A.M.	11 - 12 A.M.	12 - 1:30 P.M.	1:30-2:30 P.M.	2:30-3:30 P.M.	3:30-4:30 P.M.
WORK UNIT - TYPE A	7	10	28	60	34	33	22	6
WORK UNIT - TYPE B	12	18	33	78	60	52	31	3
WORK UNIT - TYPE C	13	13	41	46	53	51	21	8
WORK UNIT - TYPE D	6	14	32	49	61	40	17	11
WORK UNIT - TYPE E	19	17	27	49	46	38	22	2
TOTALS	57	72	161	282	254	214	113	30
PERCENT	4.8	6.1	13.6	23.8	21.5	18.1	9.6	2.5

77.0% received between 10 A.M. - 2:30 P.M.

Figure 3

PHASE 21. EVALUATE PENDING WORKLOAD

Do not skip this phase if there is no pending workload. The lack of a pending workload may be the key to a serious problem such as overstaffing or poor manpower utilization. While a large pending workload may result in slower service, management should ask how much it is willing to pay for fast service. There should be a happy medium where good service is given at a reasonable cost.

There are three breakdowns of a pending workload which should be developed so the significance of the work on hand can be interpreted.

ACTIVE PENDING WORKLOAD TOLERANCE

The active pending workload tolerance is defined as the number of days of pending workload considered by the Service as normal for current operations and essential for effective manpower utilization. If the Service has not made this determination, the analyst should work with the supervisors to arrive at a reasonable workload tolerance level. Some workload cushion is necessary as a fill-in for periods when there is not enough work coming in to keep everybody busy. A belief that all work must be processed as soon as it is received results in wasteful overtime and overstaffing. This applies even to those Services that give direct service to veterans since there is usually some paperwork or filing that can be set aside for slack periods.

ACTIVE PENDING WORKLOAD

After the Active Pending Workload Tolerance Level has been established, the analyst should compute the Active Pending Workload in the Service at the time of the manpower review. This is accomplished by developing a workcount of all pending workload items and multiplying these figures by the related work-rate standards under the work measurement system. If there is no work measurement system, the analyst with assistance of Service personnel should make technical estimates of unit time requirements for significant work units. The number of manhours required to process the pending workload can then be computed. To arrive at a figure for comparison with the Active Pending Workload Tolerance described in the previous paragraph, multiply the total number of direct labor employees (See definition Attachment I) by 8 hours and divide this figure into the manhours of work remaining to be processed. The result will be the number of days required to

process the active pending workload. If this figure is consistently less than the Active Pending Workload Tolerance, there is a good chance that the employees are pacing themselves or doing nothing during a portion of the day. This would indicate overstaffing. If the Active Pending Workload exceeds the established tolerance level, understaffing or need for improvements in the operation may exist.

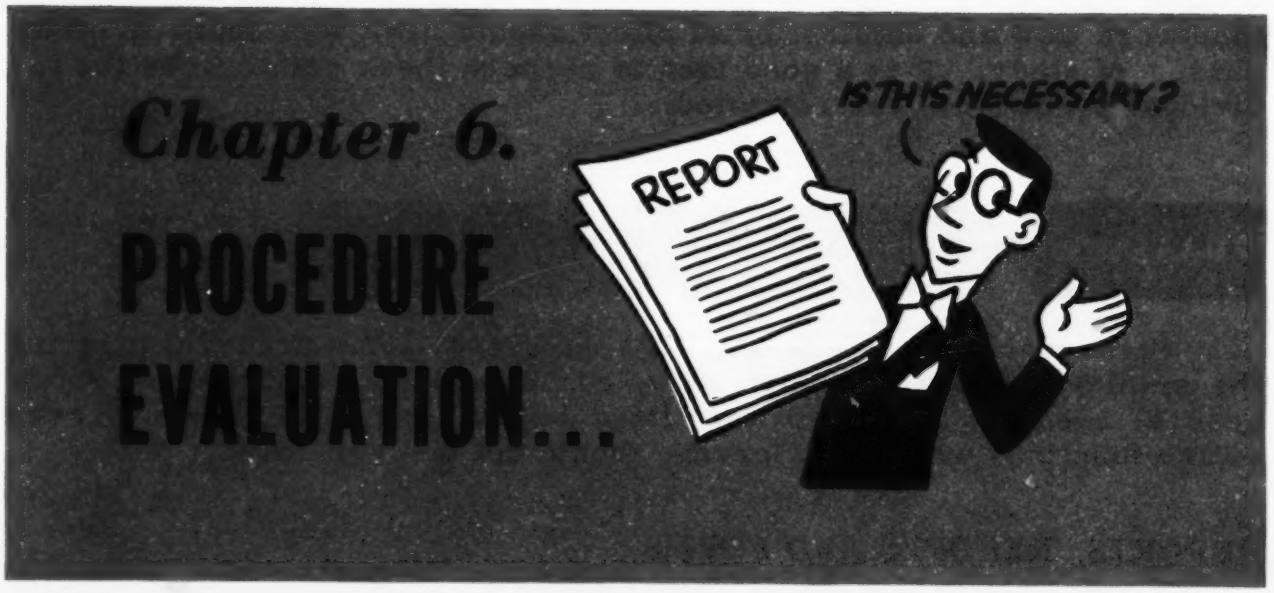
WORKLOAD BACKLOG

The Workload Backlog is computed by subtracting the Active Pending Workload Tolerance from the Active Pending Workload, both of which are expressed in days carried to one decimal place. For example, if the pending workload is 8.2 days and the tolerance is 3.0 days, a backlog of 5.2 days exists. This backlog should be analyzed to determine:

- Significance
- Cause and possible remedial action
- Trend, increasing or decreasing from prior periods
- Relationship to borrowed and loaned time or overtime
- Relationship to incoming workload

The above backlog computation and analysis should be made on a section basis if similar activities within the Service are grouped in the organization alignment.

It is not unusual to find periods of backlogs alternating with periods of idleness due to irregular workflow. Both of these situations are undesirable and the Active Pending Workload Tolerance should therefore be set as high as possible to give maximum flexibility in the flow of work before a backlog exists under the above computation. Phase 19 "Study Timing of Incoming Workload" shows how to accumulate information on the incoming work. This information should help to coordinate manpower and workload requirements.



PHASE 22. REVIEW OF PROCEDURES

There is generally a good payoff from a procedural analysis but looking at all procedures in detail is too time consuming for a manpower review of this type. A good system design study should be undertaken as time permits since the benefits will usually justify this effort.

For the purpose of this review, single out major procedures which may be deterrents in attaining maximum utilization of manpower. Select procedures involving several employees because even small improvements can result in substantial cost reductions. A lead on other procedures to be looked at may be attained from a review of both approved and disapproved suggestions submitted by the employees.

Obvious improvements to the selected procedures can be accomplished without flow charts or other detailed media. A work Distribution Study has the advantage of isolating duplication, potential eliminations, revisions or work which can be accomplished by employees with lower grades than those assigned to do the work. Replacement of antiquated equipment should be considered during the procedural review. Supply usage should also be studied as the use of disposables could result in manpower savings in some areas. The next two phases are related to a procedural review but are considered important enough to justify special attention. Weaknesses such as bottlenecks, excessive reviews,

poor work flow and duplication of effort should have been found in other phases of study. It is a good idea to recheck these points when the individual procedures are reviewed.

PHASE 23. REVIEW ESSENTIALITY OF WORK

Some work being done may be a carryover from predecessors and the employee doing the work today cannot explain its purpose. A few general areas to look into are listed below but specific tasks or even entire functions within the Service should not be overlooked.

REPORTS, RECORDS AND FORMS

All local reports should be checked to get a rough estimate on the cost of each one. Who uses it? What is the information used for? What would happen if the report was eliminated? Do its benefits justify the cost of preparation? Is the information available elsewhere? Is the report obsolete? Can the amount of data be reduced? Can the frequency be reduced? The supervisors of the Service may not be able to answer these and other questions thereby requiring contact with those who receive the reports. Local forms and other records should be reviewed in much the same manner.

Another kind of paperwork to look into is the maintenance of data which never leaves the Service. The keeping of updated data should justify a valid need. This type of paperwork should be eliminated if, for example, its purpose is to provide a source for answering infrequent requests for information which can be developed, as required, from source documents.

LOGGING OF WORK

Logs are often kept as a protective device to the Service in the event a document is lost or mislaid. This is expensive insurance if losses are infrequent or if the document can be reconstructed by the sender. If the log does not enable location of the missing document, is its maintenance for protective reasons justified?

MISCELLANEOUS DATA

Employees generally like to keep busy and will create work if the supervisor does not schedule enough during the day. There are

also certain things employees enjoy doing whether or not a contribution is made to carrying out the mission of the Service. Nonmandatory charts, graphs, maps, statistical tables and so forth fall into this category. This type of activity should be closely regulated. The analyst should make it clear that new ideas are to be encouraged but that these ideas should be evaluated and approved before becoming a permanent fixture.

PHASE 24. CHECK FOR EXCESSIVE REVIEWS OF WORK

The fear of releasing documents with errors sometimes leads to unwarranted reviews. The control should not cost more than it saves. An exception would be where an error could have dire results.

Reviews may have the opposite effect from that intended. An employee who knows his work is going to be reviewed may become careless. Likewise, the reviews may be made in a cursory manner either because the reviewer (1) finds few errors or (2) puts too much reliance on the accuracy of the original work.

The placing of responsibility on one employee or a group of employees for the accuracy, timeliness, compliance and condition of the work will generally result in good quality. Supervisors can use sampling techniques to obtain an estimate of the actual quality level and deficiencies can be traced back to the individual(s) making the errors. Corrective action in the form of additional training, counseling or reassignment can be taken if the work is not performed in a satisfactory manner.

The analyst should question the following points to help in determining whether a review is essential:

- The reason for introducing the review
- The number of errors being found by the reviews
- The possible results of errors if not found
- The cost of the review compared to resultant savings.

In addition to formal reviews, employees may be making informal reviews not recognized by the supervisors. A good way to detect this is to watch how many employees work on the same document or procedure. If more than one employee with the same or similar position

is involved, there is a good chance that the work of the first employee is being double checked. This has the same effect as a formal review and the analyst should determine exactly what each employee is doing to complete the processing cycle. Elimination of any noted duplication should be recommended. One solution would be job enlargement as suggested by Phase 14.

Chapter 7.
SPECIAL STUDIES. . .

PHASE 25. DEVELOP FLOOR PLAN

A good floor plan, or plans if the Service is located in several places, contributes to efficiency. A rough draft of the floor layout should be developed with all furniture and equipment in place. A new layout can then be made by the use of moveable templates of the furniture and equipment. If the Service is too large to make this feasible, an analysis can be made by observation without actually drawing a detailed floor plan. The factors to be considered are:

RELATIONSHIP AMONG JOBS, PEOPLE AND EQUIPMENT

- Equipment should be located close to those using it.
- Employees who have many visitors should be near entrances.
- Employees should be in front of or around supervisors.
- Unused equipment or furniture should be removed.
- Employees doing the same type of work should be grouped.
- Equipment needs should be re-evaluated if employees are waiting to use it.

WORK FLOW

Trace the work flow for each major activity. A circle for numbering each procedural step consecutively with an arrow representing the direction are simple symbols for this plotting. (① ⟶ , ② ⟶ , etc.) Work should flow smoothly with no backtracking and within as little space as possible. If any deficiencies are noted, revamp the work flow and rearrange the furniture and equipment with the moveable templates.

EMPLOYEE TRAFFIC

Arrows should be used to plot the direction and amount of walking by employees within the area. A judgment can then be made on the adequacy of aisle spacings. It should also be observed if there are any obstacles in paths which the employees must follow to complete particular work actions.

OUTSIDE TRAFFIC

If visitors, patients or beneficiaries are interrupting employees asking directions or where to leave samples, more strategically located signs are probably needed for their guidance.

WALKING REQUIREMENTS

One of the generally accepted improvements in layout is to move a file or piece of equipment next to the employee's desk if walking is involved. This is good logic but it is not always effective. Some walking is good for the employee to break the monotony. However, there are instances where walking is excessive resulting in a loss of valuable time. The employee is also exposed to social amenities during the walk which may delay an immediate return to the work place. The analyst should use good judgment in determining the extent to which walking is justified but should not automatically combine everything in one place if the loss of time is not significant.

PHASE 26. CONDUCT COMPARATIVE ANALYSIS

This step has limited applicability at any one field station but should be used whenever possible for its potential benefits. It involves a comparison of the organization and methods of similar operations to

find variances which may furnish clues as to strengths and weaknesses that may exist. One possibility for comparison tests would be operations broken down into units due to their size or geographical setting - for example, nursing units in the various wards. Another possibility would be a comparison of methods used by employees in a common position, such as ward clerks, to see if individual clerks have developed an innovation that might be used by other ward clerks. The comparison technique has value only for the isolation of differences. Once these differences have been isolated, an analysis is necessary to determine if any benefits will result from adjustments to make all operations homogeneous.

PHASE 27. CONDUCT WORK SAMPLING STUDY

Work Sampling is based on random sampling techniques. An observer objectively classifies into predetermined categories what he sees at random times during the day. These classifications are recorded on a tally sheet as each observation is completed. After a sufficient number of tallies, a distribution is made showing what percentage of the tallies have been recorded under each of the categories. The percentage distribution so developed will tend to reflect the actual percentage of time spent by the employees on each category.

This phase of the study will furnish an estimate of the idle time within the Service. The reason for the idle time could be work shortage, fatigue or personal pursuits. This determination will assist the analyst in estimating the amount of overstaffing or, conversely, the potential understaffing if the idle time is not significant, say 5% or less. It will also tend to confirm other deficiencies noted during the study such as:

- Irregular work flow
- Over-specialization
- Insufficient work
- Excessive personal time
- Poor work scheduling
- Unbalanced work loading
- Bottlenecks
- Organization deficiencies
- Insufficient workload tolerance

The analyst can break down time expenditures for categories other than those required for this phase of the study. This can be done without complicating the work sampling study to any great extent. Three

general categories on which time distribution should be developed are:

- Production - The time spent by employees doing work inherent to the mission of the Service. This also includes training, file maintenance and general housekeeping such as cleaning machines, dusting and set up/clean up time.

- Non-production - Time which is not used for production due to idleness, irrespective of cause.

- Unavailability - This category covers instances where the observation cannot be completed due to absence of the employee from the work area. The usual reasons for this absence are coffee breaks, rest room visits, lunch and business activities outside the area.

Work pressures and potential understaffing should be considered if a high percentage of time is classified under "Production" with minimal recordings under the other two categories. The amount of understaffing cannot be definitely ascertained with this technique but an analysis of each organization segment of the Service will furnish a starting point for a buildup of staffing requirements. The introduction of improvements, such as better scheduling practices, elimination of excess reviews, improved supervision and other possibilities should be studied as a means of reducing work pressures due to understaffing.

Poor utilization of manpower exists if a significant number of observations are classified under the category "non-production" and prima facie evidence of overstaffing would exist.

A detailed description of the application and interpretation of the work sampling study is furnished by Attachment V.

PHASE 28. EVALUATE QUALITY OF WORK

Lack of information may make it difficult to evaluate quality in those Services that do not have a formal Quality Control Program. In these cases, the supervisory staff should be questioned about the criteria they use for determining the quality level of work produced.

There is a relationship between quality and staffing requirements but it is usually evident only in extreme cases. The report on this study should include illustrations of qualitative deficiencies particularly

if significant understaffing is evident. Too much quality control contributes to overstaffing and should be brought out by other phases in the manpower review.

The act of finding and correcting errors is of little value if the root of the problem is not eliminated. The analyst should determine whether supervisors have a program for following up on poor quality to eliminate the cause(s). Specific illustrations of preventive actions would tend to support the existence of adequate quality control.

The Service Chief and the analyst should discuss each recommendation before a formal report is prepared. An earnest attempt should be made to reach a mutual agreement on the validity of each recommendation but considerable flexibility should be exercised during these discussions. The analyst's knowledge of the weaknesses and strongpoints of the Service will enable an effective presentation of his views. The Service Chief's experience and responsibilities require full consideration of his point of view. If agreement cannot be reached, the Service Chief should be asked to submit a statement on his position for inclusion in the report.

The potential manpower adjustments should be included in the report for each recommendation. Improvements that do not directly involve manpower should also be described.

The presentation of the report to top management is a crucial step and the necessary time should be taken to make the report effective. Brevity is important but thorough coverage should not be neglected. It is a good idea to develop a work sheet of the recommendations summarizing the anticipated benefits, timing or sequence of implementation, person having primary responsibility for implementation, reaction of the Service Chief and alternative actions, if any. Handouts may be found more effective than screen projections due to the detail involved in this type of presentation.

Finally, time should be made available by the analyst to implement changes that management approves. Little will have been accomplished if this important step is neglected by those concerned with the proper utilization of manpower.

ATTACHMENT I.

ATTACHMENT I

PERSONNEL STRUCTURE ANALYSIS (PHASE 7)

The suggested alternative method for reconstructing an organization chart under Phase 7 uses a "Supervision and Overhead Analysis Worksheet" which filters through the Service from the top by sequential completion of a worksheet by each supervisor. The first employee to complete one of the worksheets would be the Chief of the Service as illustrated by Exhibit 1; the second employee to complete a worksheet would be the Assistant Chief of the Service as illustrated by Exhibit 2; each supervisor listed in item 3 of Exhibit 2 would be the third supervisory level to complete a worksheet and so on until all supervisors, whether they supervise full or part time, have furnished information relating to employees under their immediate supervision. The supervisor who lists his (her) name in Item 2 should furnish a supply of blank worksheets with instructions to the supervisor(s) listed in item 3 as the worksheet moves through the Service. As a precautionary measure against duplication of entries or misunderstanding of the instructions, a copy of each completed worksheet should follow with the blank forms for guidance of each level of supervision as they complete a worksheet for their segment of the operation. If more than one shift is involved, each supervisor should be identified with a shift so the organization charts can reflect this alignment.

The instructions to supervisors for completion of the "Supervision and Overhead Analysis Worksheet" are as follows:

- Organizational Element - Enter the title of the Service, Division, Section, Unit or Group to which you are assigned. For example, the Chief, Fiscal Service would enter "Fiscal Service" on this line whereas the Supervisor, Accounting Section would enter "Accounting Section". A unit supervisor of Payroll would enter "Payroll Unit" and so forth.

- Name, Title and Telephone Extension - Self-explanatory.

- Next Lower Level of Supervision - List the name of employees assigned to the next lower level of supervision who report directly to you. Be sure that all organizational elements under your immediate supervision are covered. If you have an assistant, list only his (her) name. Indicate, by checking the appropriate block, whether the listed supervisor(s) supervises full or part-time. If the part-time block is checked, show the approximate percentage of time this employee spends on supervision and the percentage of time on direct labor, the total of

SPECIAL VA MANPOWER REVIEW

SUPERVISION AND OVERHEAD ANALYSIS

Date July 1, 1968

1. Organizational Element Office of Controller

2. Your Name and Title L. V. Pomerton, Controller Ext. 2972

3. Next Lower Level of Supervision:

Name of Supervisor	FT	PT	Percent Supervision	Direct Labor
D. J. Destry	✓			

4. Number of Other Employees Under Your Immediate Supervision:

Type of Position	FT	PT	= FTE	Vacant Positions
Administrative Personnel	1		= 1	
Clerical Overhead	2		= 2	
Direct Labor			=	
Other Employees			=	
TOTAL	3		= 3	

FORWARD SUPPLY OF WORK SHEETS TO SUPERVISORS LISTED IN ITEM 3

EXHIBIT 1

SPECIAL VA MANPOWER REVIEW

SUPERVISION AND OVERHEAD ANALYSIS

Date July 1, 1968

1. Organizational Element Office of Controller

2. Your Name and Title D.J. Destry, Ass't. Controller Ext. 2881

3. Next Lower Level of Supervision:

Name of Supervisor	FT	PT	Percent Supervision	Percent Direct Labor
R.N. Lenom	✓			
A.N. Itis	✓			
P.Q. Quilm		✓	80	20

4. Number of Other Employees Under Your Immediate Supervision:

Type of Position	FT	PT		FTE	Vacant Positions
Administrative Personnel			=		
Clerical Overhead	1		=	1	
Direct Labor			=		
Other Employees			=		
TOTAL	1		=	1	

FORWARD SUPPLY OF WORK SHEETS TO SUPERVISORS LISTED IN ITEM 3

EXHIBIT 2

which should equal 100%. Show number of on-duty hours if supervisor does not work full time.

- Number of Employees Under Your Immediate Supervision - List the number of other employees by type of position who are under your immediate supervision. Do not list employees who are also under the level of supervision specified in Item 3 as this will result in duplication. Provision is made for classifying the listed positions as full or part-time with the full time equivalent. The number of vacant positions should also be shown if replacement plans exist or if the positions are considered necessary for processing the current workload. The definitions of the stated position types are:

  - Administrative Personnel - Employees engaged in planning, formulation of objectives and other general administration. Examples include Management Analysts, Budget Officers and Administrative Assistants.

  - Clerical Overhead - Clerical personnel such as secretaries, stenographers, receptionists or clerk typists who are assigned to administrative or supervisory personnel for processing work generated in their immediate office.

  - Direct Labor - Professional or non-professional employees who do work directly related to the rendering of services or production of end-products required to fulfill the responsibilities of the Service.

  - Other Employees - List by title the number of employees under your direct supervision who have not been included under one of the above categories. (The analyst conducting the study can add additional categories if a more detailed breakdown is considered desireable. Too much detail is sometimes unmanageable and the suggested categories should be adequate for most situations.)

Additional guidelines required for the completion of the Worksheet are:

- Employees in a borrowed or loan status will be reported by the supervisor to whom assigned irrespective of where the employee may be working at the time the work sheet is prepared.

- If a supervisor is on leave more than than three days, a worksheet for this supervisor should be completed by the employee acting in his (her) absence. An acting supervisor will also complete a worksheet to cover his (her) regular position.

An organization chart can be drawn by the analyst upon receipt of all completed worksheets for the Service under study. The known overall personnel strength of the Service should be reconciled with the total number of employees reported on the worksheets to insure that there is no duplication or omission of personnel. The analysis prescribed by Phase 7 can now be made on the basis of the information collected under the instructions of this attachment.

ATTACHMENT II.

ATTACHMENT II

CHARTING PERSONAL RELATIONSHIPS
(Phase 8)

Exhibit 3 shows one way to check the significance of an informal organization through the plotting of personal relationships. This chart is developed by observation and its use will depend on whether a significant amount of traffic was noted under Phase 4, Observe the Operation. The arrows indicate the number of times a particular employee contacted another employee during an eight hour period. The circle at the end of the arrow shows the approximate number of minutes spent conversing with the employee. Do not chart instances involving transportation of documents where no significant conversation takes place, or expected chit-chat of less than 30 seconds. The numbers inside the employee block represent the minutes spent on each visit to the supervisor; if circled, the supervisor(s) visited the employee. The numbers inside the squares indicate visits from outside sources. The (a) shows that prima facie evidence suggested the contact was of a social nature whereas (b) shows business matters were discussed as evidenced by referrals to a document or other reference material. The finished chart evidence will indicate whether the supervisor is being left out of some decision making with its accompanying loss of needed information. It will also show who the employees are looking to for information and guidance and how much time is spent on this type of communication broken down into (a) social and (b) business. If the plotting becomes cluttered because of heavy traffic, use additional charts which can be consolidated later for report purposes. The chart can be placed in narrative form showing:

- Who contacted whom
- Number of contacts broken down by (a) and (b)
- Total minutes expended broken down by (a) and (b)

The disadvantage of narrative instead of chart information is the loss of visual clarity on the frequency of contacts among the selected group of employees.

COMMUNICATION ANALYSIS

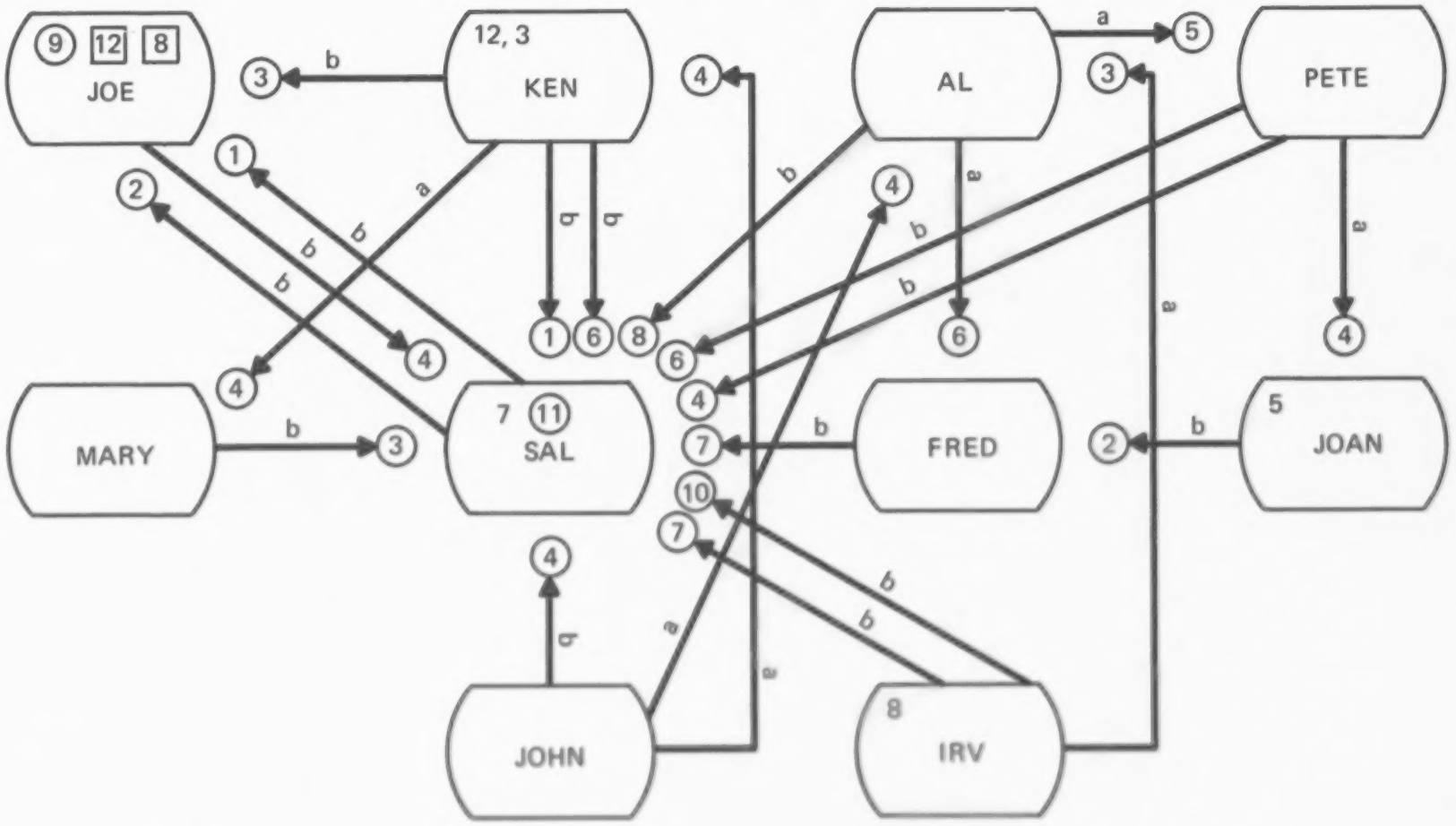


EXHIBIT 3

ATTACHMENT III.

ATTACHMENT III

PRODUCTIVITY MEASUREMENT
(Phase 9)

Exhibit 4 shows a suggested method for computing productivity. This method uses an "Index of Workload" and an "Index of Manpower" as a base for computing a Partial Productivity Index.

There are other variations which can be used effectively for comparing productivity levels from year to year. The number of "units per FTEE" is frequently used and can be obtained by dividing line 2 "Total Weighted Workload" by line 3 "FTEE", Exhibit 4. A partial productivity index can then be computed by dividing the "Units per FTEE" for the current year by the "Units per FTEE" of the base year. This approach would be an acceptable alternative to the proposed method provided the units of work produced are weighted as shown by line 1, Column B of Exhibit 4 and carried forward in total, Column D, to line 2. The use of unweighted units is not acceptable as any shift in the frequency distribution of the units from year to year would result in a comparison of totals made up of heterogenous units. The exception, of course, is where only one work unit is required for measuring productivity.

The entries on Exhibit 4 are developed as follows:

Line 1, Column A, Work Units - The work units selected for measurement should be few in number to facilitate computations and attainment of workcounts. Work measurement systems which have several work units to insure greater accuracy can be modified by using only those which generate a major portion of the workload. The work rate standards for these selected work units should be adjusted upward to cover time requirements for those work units not used in productivity measurement. Examples of work units which may be used are Rations Served, Patient Days by Category of Patient, Line Entries, X-rays by Major Type, Cases Processed, Interviews Conducted, Admissions, Discharges, Forms Processed or any other broad workload indicators which may be related to the resource requirements of the Service. In some cases, only one work unit may indicate resource requirements whereas several work units may be needed to measure productivity in other Services. The number of units selected should be held to a minimum since productivity measurement, unlike work measurement, is a broad-gauged measure of an entire program and does not require the detail necessary for measuring a segment of an operation or a single employee.

Line 1, Column B, Weights - The introduction to Phase 9 has pointed out that weights can be developed from technical estimates without a detailed study. The weights should be expressed in terms of decimal hours (minutes required divided by 60). The productivity

weights should be set to provide for a reconstruction of all paid manhours including supervision, clerical overhead and a normal leave factor. This means that work measurement standards will require an upward adjustment to provide for leave, overhead and unmeasured activities since the time included in these standards is generally restricted to productive manhours. The same weights are used throughout the five year period and are not changed to reflect procedural or organizational improvements.

Line 1, Column C, Number of Units - This figure represents the number of work units processed during the year.

Line 1, Column D, Manhours Required - Column B times Column C.

Line 3, FTEE - The average full time equivalent employees on duty during the year.

Line 4, Index of Workload - For the purpose of this example, assume that a computation illustrated by Exhibit 4 was made for the base year, FY 1963, with the following results:

Weighted Workload - 72,930
FTEE - 37

(The productivity index for the base year is automatically set at 100%).

The FY 1964 Index of Workload can now be computed by dividing the Weighted Workload for FY 1964 by the Weighted Workload for the base year (FY 1963) or 70,686 + 72,930 x 100 = 96.9%. In effect, this means that the Weighted Workload declined 3.1 percentage points when compared to the base year.

Line 5, Index of Manpower - A comparable computation shown for Line 4 is made for the full time equivalent employees on duty or 38 + 37 x 100 is 102.7. This means that the full time equivalent employees increased 2.7 percentage points when compared to the base year.

Line 6, Productivity Index - The productivity index is computed by dividing the Index of Workload (96.9) by the Index of Manpower (102.7) x 100 which results in an index of 94.4% for FY 1964. This figure reflects a downward trend of productivity when compared to the base year since the FTEE was increased notwithstanding a decline in the workload for FY 1964.

Similar computations for fiscal years 1965, 1966, 1967 and 1968 should be made. Each of these years would be compared with the base year 1963 as illustrated by Exhibit 4 for 1964. A table can then be prepared showing the productivity changes during the five year period.

An analysis of the productivity changes should be made keeping in mind that only one resource - manpower - is included as an input. Any automation introduced into the Service during the five year period should have resulted in a substantial productivity increase since the cost of capital goods (equipment in this case) has not been used in the formula as an offset to the reduced manpower requirements. An increase in productivity would be expected from any organization change if improvement in manpower utilization was one of the goals. If not, why not? If no significant changes in the operation have taken place during the five year period, some upward trend in productivity may be attributable to an improvement in employee efficiency although the possibility of understaffing should not be overlooked. The analyst's observations and study during this manpower survey plus a review of previous personnel requests, if any, should enable a decision in this respect. Conversely, a decrease in productivity would indicate that overstaffing has developed which should be corrected.

COMPUTATION FOR PRODUCTIVITY INDEX

Period: FY 1964

BASE YEAR - FY 1963

Weighted Workload - 72,930

FTEE - 37

1. Work Units (A)	Weight (B)	No. of Units (C)	Man-Hours Required (D)
Unit Type A	1.20	7,889	9,467
Unit Type B	2.75	6,990	19,223
Unit Type C	3.40	6,821	23,191
Unit Type D	2.35	8,002	18,805

2.	Total Weighted Workload - - - - - - - - - - - - - - - - -	70,686
3.	FTEE -	38
4.	Index of Workload - 70,686 (FY 1964) ÷ 72,930 (FY 1963) x 100 - - - - -	96.9
5.	Index of Manpower 38 (FY 1964) ÷ 37 (FY 1963) x 100 - - - - - - - - - -	102.7
6.	Productivity Index (Partial) 96.9 ÷ 102.7 x 100 - - - - - - - - - - - - - - - - - -	94.4

Exhibit 4

ATTACHMENT IV.

ATTACHMENT IV

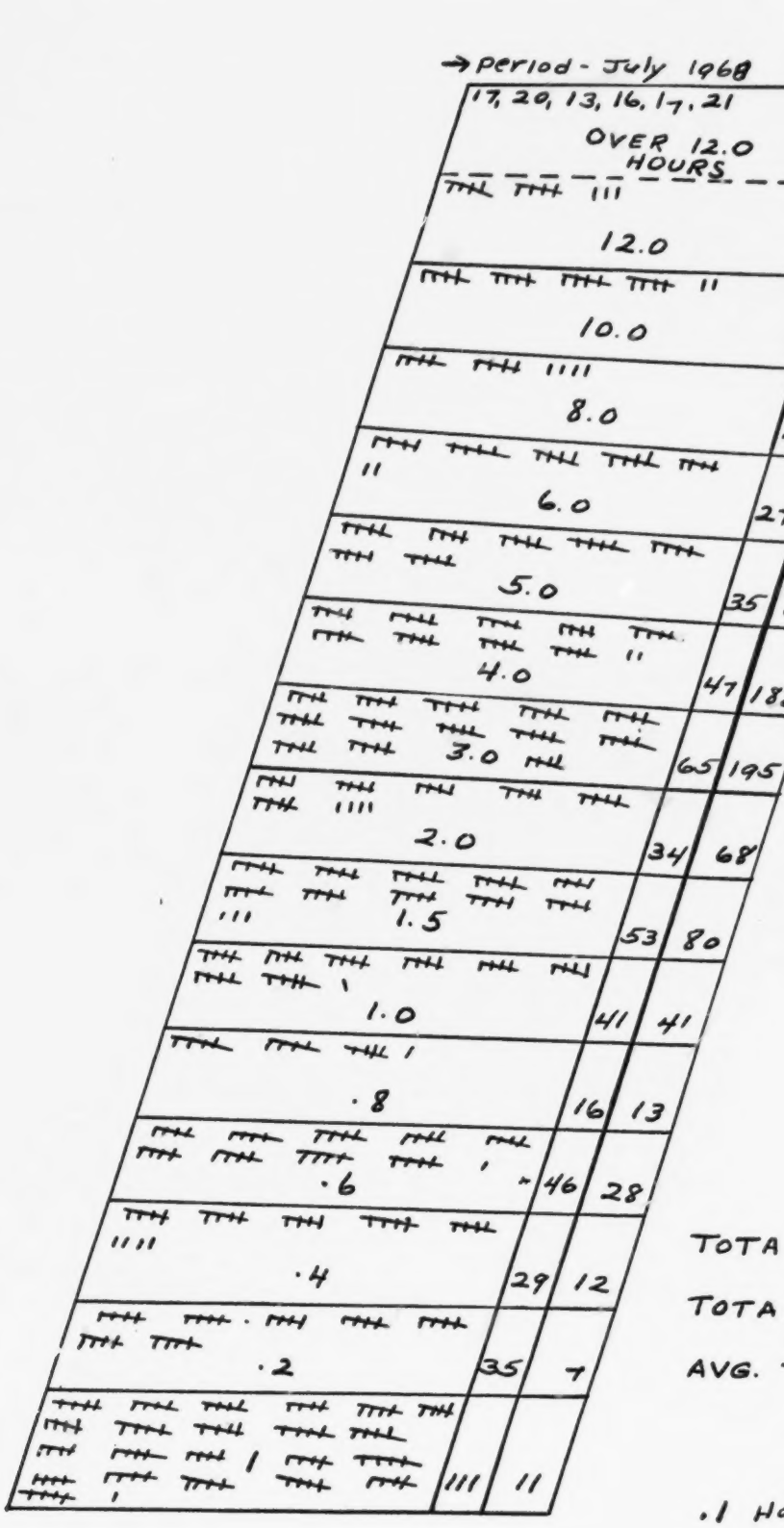
DETERMINING MANPOWER REQUIREMENTS
(Phase 10)

The attached "ladder", Exhibit 5, includes "slots" for checking off the job as it comes in for processing.

The supervisor, or designee, through estimates based on technical knowledge or similar jobs previously processed (sometimes called "benchmarks") classifies each job as it is received and inserts a checkmark into the "slot" which most nearly represents the estimated time requirements for processing. This, in effect, forces an average time for all jobs received during the month.

This technique is especially useful in those work areas where average elapsed time standards are not feasible due to (1) low volume or (2) a wide variation in time requirements for completion of any one job. The "mixture" of these jobs is not usually consistent from month to month and the use of an "average processing time" per unit is impractical under these circumstances.

The 1572 hours accumulated on Exhibit 5 represents the raw time required to do the work for the month of July 1968. This figure should be increased by 25% to 2096 (1572 $\div$ 75%) to provide for normal leave and personal time. A division of 2096 by 176 (22 workdays in July 1968 x 8 hours) results in a staffing requirement of about 12 direct labor employees.



TOTAL UNITS - 594

TOTAL HOURS - 1572

AVG. THIS MO - 2.65

.1 HOUR = 6 MINUTES

EXHIBIT 5

ATTACHMENT V.

ATTACHMENT V

Work Sampling Study
(Phase 27)

The following guidelines cover the basic requirements for the work sampling study, phase 27:

CATEGORIES TO BE COVERED

The introductory comments under Phase 27 prescribe three categories to be covered by the work sampling study (1) Production (2) Non-Production and (3) Unavailability. These categories should retain their identity but this will not preclude the introduction of sub-categories if the analyst desires to obtain more detailed information. For example, the category "Production" could be broken down to the types of end-products or services involved and used as a guide for establishing the weights required under Phase 9, Compute Productivity Changes.

OBSERVATION TALLY SHEET

There are many possible variations of an Observation Tally Sheet and the experienced analyst can use an adaptation from one of his previous work sampling studies.

The type of tally sheet used will vary with the layout of the Service. If the employees are all in one area at assigned spaces, a simple tally sheet can be developed as illustrated below:

OBSERVATION TALLY SHEET		1. Service	2. Section/Unit	3. No. Employees Assigned	
		Controller	Contracts	20	
WORK SAMPLING DATA					
Date (A)	Time (B)	Production (C)	Non Production (D)	Unavailable (E)	Remarks (F)
7/1	8:25	14	2	1	3 A/L
"	10:30	11	4	2	"
"	11:15	11	3	3	"
"	4:15	9	6	2	"
TOTALS		92	20	24	

Exhibit 6

The entries on the tally sheet are discussed in detail as follows:

Item 1, Service - Enter the name of the Service under study.

Item 2, Section/Unit - Provision is made for a breakdown of the Service into its organizational segments since more meaningful information is derived from random sampling when groups doing the same type of work are sampled separately. To illustrate, Phase 7 shows a hypothetical illustration of a Controller's Office having three sections (1) Accounting (2) Contracts and (3) Supply. A breakdown of the total observations by these three sections will enable a more refined decision on the location of any weaknesses noted during the analysis of the work sampling findings. A computation for the entire Service can be made by merely combining the observations in each of the three sections.

Item 3, No. Employees Assigned - The figure entered for this item should represent the number of direct labor employees and part time supervisors assigned to the Section/Unit under review. (Full time supervisors and administrative or clerical overhead positions should not be included in this random sampling study as any excess positions should have become evident from the analysis of Phase 7, Review Personnel Structure.) If on any given day one or more of the employees included under this item are on leave, a note should be made in the Remarks Column showing the number of employees involved. In Exhibit 6, the sample shows 20 employees assigned to the Contract Section with 3 employees on annual leave. The total entries in Columns C, D and E consequently total only 17 which, when added to the 3 employees on leave, accounts for the 20 employees assigned to the section. NOTE: The observant reader will find that Figure 1 actually shows 39 direct labor and part-time supervisors assigned to the Contract Section. The reason only 20 employees are included on the Observation Tally Sheet is that one observer cannot effectively observe more than this during one observation tour. This necessitates dividing larger sections by making more than one observation tour (2 in this case) for coverage of all employees in the section. Separate Random Time Schedules and Observation Tally Sheets would be used for each of the tours under this circumstance.

Column A, Date - Enter the date of the observation tour.

Column B, Time - Enter the time of the observation, which should agree with the Observation Time Schedule except for unusual circumstances which are discussed below.

Column C, Production - Insert the number of employees observed in a productive status at the time of observation.

Column D, Non-Production - Insert the number of employees who were idle at the time of observation.

Column E, Unavailable - Insert the number of employees who were not available for observation.

Column F, Remarks - This column should be used to show the number of employees on leave, detailed in or out of the section and other pertinent information.

If the employees are not centered in one place and serve a particular area (such as a nurse on a ward or a maintenance employee) it is advisable to show their names on an Observation Tally Sheet for recording their activity as they are located during the observation tour. This will insure that no employee is missed. Two options available are (1) make a separate tally sheet for each employee or (2) list the names of all employees on one tally sheet. The format in Exhibit 6 can be used for the first option by substituting "Employee Name" for "No. Employees Assigned", Item 3. A single form for each employee should last for the entire period of the study. The revised heading will appear as follows:

OBSERVATION TALLY SHEET	1. Service	2. Section/Unit	3. Employee Name
	Controller	Contracts	F. Liltz

The body of the form will not change but the entries will be a checkmark (✓) for each employee in the appropriate block of Columns (C) (D) or (E) instead of the total number of employees when groups are observed.

The second option is to list each employee's name by creating another column on the left side of Exhibit 6. A separate Observation Tally Sheet should be used for each observation tour under this arrangement to avoid confusion in making entries. The Observation Tally Sheet under this option would look like Exhibit 7.

RANDOM TIME SCHEDULE

A random time schedule should be developed for each observation tour. The number of observations prescribed should approximate 500 over a one week period for each section/unit of the Service. This means that 50 observation tours (or 10 each day for a 5 day week; 7-8 each day for a 7 day week) will be required if 10 employees are assigned to the section (50 tours x 10 employees equals 500 observations). If 20 employees are assigned to the Section, 25 tours would be required. This is also the minimum number of tours since, as previously stated, larger

OBSERVATION TALLY SHEET	1. Service: Controller	2. Section/Unit: Contracts	3. Date: 7/1
			4. Time: 8:25

WORK SAMPLING DATA				
	(✓) one column for each employee			
Employee Name (A)	Production (B)	Non Production (C)	Un-Available (D)	Remarks (E)
Fred Litz	✓			
Jane Smith				AL
Sal Flesso		✓		
TOTALS	14	2	1	

Exhibit 7

sections should be split into fixed segments of not more than 20 employees. 32 observation tours would be required for 16 employees and so forth. Sections having fewer than 5 employees should be combined or added to a larger section for observation purposes.

The times established for the observation tours must be developed on a random basis to insure validity of the results. This can be done in a number of ways and analysts who are familiar with selection techniques from a Table of Random Numbers should use this method. Otherwise, a simple method for developing random observation times is as follows: Assume that 40 observation tours are required to obtain 500 observations in a section operating on a 5 day week. Eight observation tours per day will be required (40 tours ÷ 5 days). Separate slips of paper should be numbered to show the times of the day at 5-minute intervals covering an eight hour period plus lunch. To illustrate, if an office opens at 8:00 a.m. and has a half hour lunch period, one slip would be numbered 8:00, another 8:05, another 8:10 and so forth through 4:25 making 102 slips in all. These slips are mixed thoroughly and one is drawn to represent an observation time for a tour on the first day of the study. The slip is then replaced, all slips mixed thoroughly again, and a second slip is drawn to represent a time for another tour. This process is continued until random numbers have been selected for each of the eight tours required on the first day of the study. Example: A random selection of 8 slips were as follows: 11:15, 10:30, 1:05, 1:55, 4:10, 4:00, 8:25 and 2:35. These times are arranged in an ascending sequence and would represent an Observation Time Schedule for one section/unit on Monday as follows:

OBSERVATION TIME SCHEDULE

Observation #1 - - - - - - - - - - - - 8:25 a.m.

Observation #2 - - - - - - - - - - - - 10:30 a.m.
Observation #3 - - - - - - - - - - - - 11:15 a.m.
Observation #4 - - - - - - - - - - - - 1:05 p.m.
Observation #5 - - - - - - - - - - - - 1:55 p.m.
Observation #6 - - - - - - - - - - - - 2:35 p.m.
Observation #7 - - - - - - - - - - - - 4:00 p.m.
Observation #8 - - - - - - - - - - - - 4:10 p.m.

Similar selections would be made for development of an Observation Time Schedule for each of the next four days to cover this section. The entire process would be repeated for any other sections/units in the Service. These time schedules should be kept confidential so the employees being observed will not know when an observation tour is scheduled.

In order that each minute of the day has an equal chance of being utilized for the start of an observation tour, an observation scheduled for 8:00 a.m. can be started anytime between 8:00 a.m. and 8:02$\frac{1}{2}$ a.m. An observation scheduled for 9:30 a.m. can be started anytime between 9:27$\frac{1}{2}$ a.m. and 9:32$\frac{1}{2}$ a.m. and so forth. If observations are grouped too close together (or at the same time) to allow completion of one tour before the next one is scheduled, complete the tours consecutively without being concerned that one tour begins late. This type of deviation from the time schedule will not introduce bias provided the schedule is otherwise followed in a diligent manner. If a tour is missed due to oversight, select another number to make it up. This type of deviation should be avoided to the extent possible but a realistic approach is necessary to cover human failings.

If all employees leave for lunch at the same time, say 12:00 Noon to 12:30 p.m., no observations should be taken for this period and necessitates the drawing of substitutes for numbers 12:00 - 12:30. If the lunch is staggered, observations should be scheduled and made throughout the day.

The analyst will find it necessary to use additional observers for larger Services or do only a portion of the Service each week. A good source for obtaining additional observers are full time supervisors assigned either to the Service under study or to other Services.

MAKING THE OBSERVATION

The observations are made on a split second basis. Precautions must be taken to insure that the classifications into the various categories represent the employee's status at the precise moment of observation. This is particularly vital for the category "Non-Production" as an idle employee will undoubtedly try to look busy when the analyst makes an appearance for an observation. For this reason, the observer

should immediately scan all employees, if grouped, to determine the number of employees who are not in a productive status. The remaining employees can then be counted, all of whom will be classified into the "Production" category. The difference between the total of these two figures and the employees on duty will represent those unavailable for observation. To illustrate, suppose there are 20 employees assigned to the section/unit with 2 employees on leave. The analyst quickly scans the group and finds 4 in a non-productive status. A count of the employees in the work area totals 17 so 13 are in a productive status (17 minus 4) and one is unavailable for observation (18-17). The practice of scanning the group immediately to pick up employees in a non-productive status should be followed even though categories are established in addition to the three used in this example.

If the employees are not grouped, it is essential to keep in mind that observations are instantaneous and no significance should be placed on the employee's work status after the observation has taken place. This is why it is necessary to make the classification as soon as the employee is seen. A reconstruction of actual conditions will not result if the employee is successful in changing his work status because an observation is about to take place.

The easiest way to overcome the possibility of introducing bias into the study is for the analyst to remain within the Service at all times and make observations as they come up on the Observation Time Schedule. This will eliminate the need for making an entrance for the observation tour and the employees will not know when observations are taking place. The analyst can be conducting reviews on other prescribed phases between observation tours if the Observation Time Schedule does not require continuous attention.

There is one factor which may cause difficulty and that is where one, two or even four employees are working in a small room with the door closed. There is a natural tendency to look up when the door is opened and the observation for "Non-Production" is obviously impractical under these conditions. If arrangements cannot be made to keep the doors open, observations should be limited to the other categories for these employees. The non-productive time found for other employees in the Service will be indicative of the idle time factor even though these employees are not sampled.

SUMMARIZATION OF DATA

Exhibit 8 illustrates how to summarize the data developed from the work sampling study. Column A, Category, should include further breakdowns if additional categories were sampled.

SUMMARY		
Service: Controller Section/Unit: Contracts		
Category (A)	Number of Observations (B)	Percentage Breakdown (C)
Production	327	64.4
Non-Production	92	18.1
Unavailable	89	17.5
TOTALS	508	100.0

Exhibit 8

Column A - lists the categories selected for the study.

Column B - represents the total number of observations classified by the observer(s) into each category during the week.

Column C - shows the percentage breakdown of Column B which signifies the amount of on-duty time spent on each category by the employees as a group.

ANALYZATION OF DATA

An analysis of the data in Exhibit 8 can now be made.

- Production - No specific guidelines are suggested by this pamphlet on the amount of time which should be classified into this category due to variability between Services on outside business activities. The normal amount of production without outside business requirements can be calculated at about 85% which allows 10% for personal needs (Unavailability) and 5% for fatigue (Non-Production).

- Non-Production - Since provision is made for training, file maintenance and general housekeeping under the category "Production", the classifications under this category represent idle time and prima facie evidence of overstaffing. An allowance of 5% can be made for fatigue so the 18.1% idle factor developed by this example (Exhibit 8) would suggest a 13% reduction of the direct labor employees. (Exception exist, such as one or more

employees having a significant amount of unavoidable delay time due to the need for minimal staffing at all times to cover sporadic patient or beneficiary traffic.)

- Unavailability - About 10% of the time classified into this category should be allowed for personal needs in the form of rest room visits and coffee breaks. If the observations in this category exceeds 10% (plus lunch if sampled) to any extent, a determination should be made on whether the excess can be justified for outside business activities. If not, a further staffing adjustment is indicated on the premise that too much time is being spent on personal needs or idleness outside the work area.

SAMPLING ERROR

A method of computing the sampling error in the estimates developed under the format of Exhibit 8 is furnished so the analyst will have a reasonably close answer if the question arises. Exhibit 9 is a nomograph which can be used for this purpose. Assume that 1580 observations were made in a Service having three sections/units. The percentage of observations classified under "Non-Production" was 18%. The nomograph, Exhibit 9, based on a 95% confidence level or 2 standard deviations, can be used to determine the standard error in this estimate as follows:

The first column, Element to be Measured (per cent) represents the 18.1% non-productive time. The third column, Number of Observations, is 1580 for this example. The Precision Interval, Column 2 of the nomograph, can be attained by holding a ruler on 18% (just above the 80-20 breakdown in the first column) and 1580 in the third column. The ruler will cross at about 1.9 meaning that the precision interval, or sampling error stated in absolute terms, is 1.9 percentage points. Stated another way, the true non-productive time is somewhere between 16.2% (18.1 minus 1.9) and 20.0% (18.1 plus 1.9) which allows for the 1.9% absolute error in the sample estimate. A similar analysis can be made for each section/unit in the Service.

* * *

Work pressures and potential understaffing should be carefully considered if a high percentage of time is classified under "Production" with minimal recordings under the other two categories. The amount of understaffing cannot be definitely ascertained with this technique but an analysis by section/unit will furnish a starting point for a buildup of

WORK SAMPLING

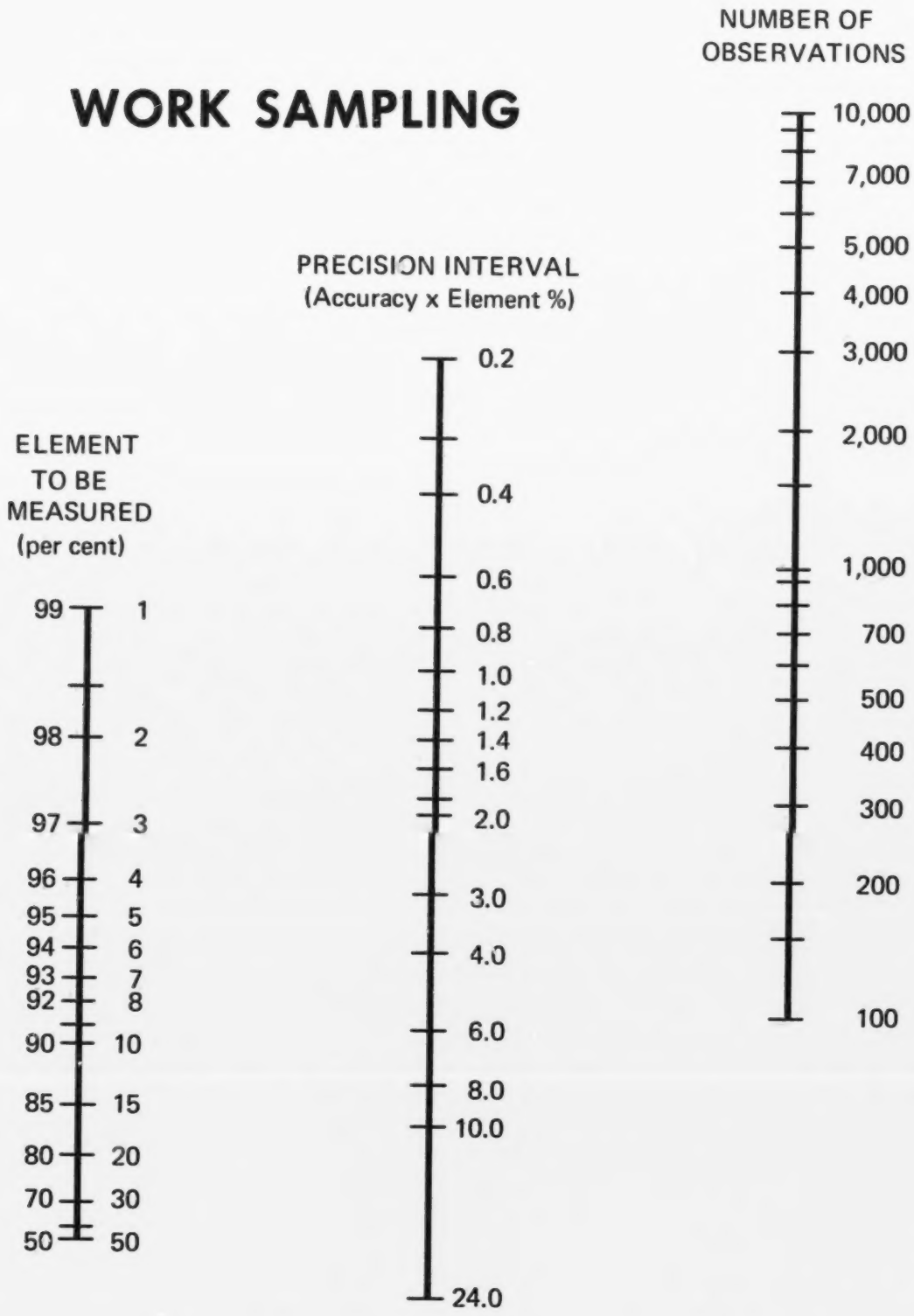


EXHIBIT 9

staffing requirements. The introduction of improvements such as better scheduling practices, elimination of excess reviews, improved supervision and other possibilities should also be studied as a means of alleviating the apparent work pressures.

The study initially should be limited to the day shift. If any significant disclosures are made evident, a further study of the evening and night shifts may be found necessary.

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Distribution: Per VA Form 3-7225.
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☆U. S. GOVERNMENT PRINTING OFFICE : 1969 O - 345-207 (72)